COMMUNICABLE DISEASE CENTER

ENCEPHALITIS SURVEILLANCE

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE / PUBLIC HEALTH SERVICE

PREFACE

Summarized in this report is information received from State Health Departments, university investigators, virology laboratories and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address to:

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I. SUMMARY

During 1963, 2,362 cases of encephalitis, including 184 deaths were reported to the Encephalitis Surveillance Unit (ESU). Of the total, 1,285 (53 percent) were reported by etiology. Mumps and measles accounted for over two-thirds of these. Arbovirus encephalitis cases were comparatively rare, accounting for only 76 cases. Only one outbreak, in the high plains area of Texas, was recorded during 1963. Data on human cases and isolates obtained from other than human sources are summarized in Section II.

Special epidemiological reports in Section III include: a description of the single recognized arbovirus outbreak in the United States during 1963; a clinical account of the first recognized human case of encephalitis attributed to the California virus; and notation regarding the isolation of Venezuelan Equine Encephalitis Virus for the first time in the United States.

A description of outbreaks of Western Encephalitis in Saskatchewan and Venezuelan Equine Encephalitis illnesses in Venezuela during 1963 are described under foreign reports.

A summary of equine viral encephalitis cases reported to the USDA is included in Section V.

II. MORBIDITY TRENDS

For the year 1963 a total of 2,362 cases of encephalitis, including 184 deaths, was reported to the Encephalitis Surveillance Unit (ESU). The 1963 cases are presented below by etiology in Table 1 and classified by State in Table 2 on pages 2 and 3.

The definitions employed are those agreed upon at the 1963 Biennial Conference of State and Territorial Epidemiologists as follows:

1. Post-infectious encephalitis, defined as an illness with encephalitic manifestations but with a preexisting diagnosed infection. Post-infectious encephalitis includes those associated with mumps, measles, rubella, vaccinia, etc.

2. Primary encephalitis, defined as an acute febrile illness with encephalitic manifestations as an intrinsic part of the disease. The category will include ARBO infections, as well as acute encephalitis of unknown etiology.

Table 2
Reported Cases of Infectious Encephalitis
By State According to Etiology*

State	Total Cases (ESU)	Post-Infectious Encephalitis						Primary Encephalitis	
		Measles	Mumps	Varicella	Influenza	Post Vaccinal	Other**	Arthropod-borne	Etiology Unknown
Ala.	2 (2)	0	0	0	0	0	2 (2)	0	0
Alaska	4	0	0	0	0	0	0	0	4
Ariz.	9 (1)	1 (1)	0	0	0	0	0	1	7
Ark.	14 (3)	2	3	0	0	0	1 (1)	0	8 (2)
Calif.	471 (17)	87 (6)	186 (1)	23 (7)	1	0	12 (3)	15	147
Colo.	56 (3)	2 (2)	9	1 (1)	12	0	0	2	30
Conn.	15 (5)	0	4	0	0	0	0	0	11 (5)
Del.	3	0	0	0	0	0	3	0	0
D. C.	7	0	6	1	0	0	0	0	0
Fla.	124	4	64	5	0	0	32	1	18
Ga.	18	0	0	0	0	0	0	0	18
Hawaii	0	0	0	0	0	0	0	0	0
Idaho	3	0	0	0	0	0	0	0	3
Ill.	101 (7)	22 (2)	51	10 (2)	5 (3)	1	12	0	0
Ind.	55 (5)	4 (1)	13 (1)	0	1 (1)	0	0	0	37 (2)
Iowa	14	0	0	0	0	0	0	1	13
Kans.	21 (9)	1	1	0	0	0	3 (2)	0	16 (7)
Ky.	18 (2)	0	3	0	0	0	14 (2)	1	0
La.	13 (4)	3	1	1	0	0	0	0	8 (4)
Maine	5 (3)	0	0	0	0	0	0	0	5 (3)
Md.	47 (9)	6 (2)	14	3	0	0	8 (2)	0	16 (5)
Mass.	20	2	8	0	0	0	0	0	10
Mich.	57	0	0	0	0	0	0	0	57
Minn.	52 (9)	13 (2)	20 (1)	2 (1)	0	0	3	2	12 (5)
Miss.	25 (2)	2 (1)	2	1 (1)	0	0	0	0	20

State	Total Cases (ESU)	Measles	Mumps	Varicella
Mo.	26 (18)	3 (3)	3 (1)	0
Mont.	15	2	1	0
Nebr.	4	0	0	0
Nev.	5 (1)	1	0	0
N. H.	2	0	1	0
N. J.	110 (16)	11 (1)	0	5
N. Mex.	6	0	0	0
N. Y.	279 (5)	15 (1)	77 (1)	8 (2)
N. C.	57 (31)	3 (1)	8	0
N. Dak.	61	2	5	0
Ohio	145 (10)	8 (3)	32	7 (3)
Okla.	43 (3)	0	30	0
Oreg.	26 (4)	2	4	2
Pa.	127 (10)	26 (3)	39	5 (1)
R. I.	35 (2)	0	21	1
S. C.	12 (1)	0	5	1 (1)
S. Dak.	16	0	3	0
Tenn.	26 (16)	0	0	0
Texas	87	2	7	2
Utah	12	4	1	0
Vt.	0	0	0	0
Va.	52 (10)	4	23 (1)	1
Wash.	46 (6)	3	25	1
W. Va.	9 (3)	4 (1)	0	4 (2)
Wis.	4	0	0	0
Wyo.	3	0	1	0
Totals	2362 (217)	239 (30)	671 (6)	84 (21)

* Figures in (parenthesis) represent deaths.
** 17 were specified (10.2%): see text

Influenza	Post Vaccinal	Other**	Arthropod-borne	Etiology Unknown
1	0	2 (1)	1	16 (13)
0	0	0	0	12 ***
0	0	0	0	4 ***
0	0	0	0	4 (1)
0	0	0	0	1
0	0	1	0	93 (15)
0	0	0	4	2
0	1 (1)	2	0	176
1 (1)	0	0	0	45 (29)
0	0	4	2	48 ***
0	0	7 (4)	0	91
0	0	4 (3)	3	6 ***
0	0	1	0	17 (4)
0	1	4 (1)	0	52 (5)
0	0	2 (2)	0	11
0	0	0	0	6
0	0	0	0	13
0	0	0	0	26 (16)
5	0	7	42	22
1	0	1	0	5
0	0	0	0	0
0	0	24 (9)	0	0
1	0	15 (6)	1	0
1	0	0	0	0
1	0	1	0	2***
0	0	2	0	0
30 (5)	3 (1)	167 (38)	76	1092 (116)

*** Includes cases which were diagnosed as arthropod-borne encephalitis from clinical information, but did not have laboratory confirmation:

Montana	7 WE
Nebraska	4 WE
N. Dakota	23 WE
Oklahoma	6 WE
Wisconsin	2 WE

Figure 1

REPORTED CASES OF ENCEPHALITIS BY MONTH
UNITED STATES, 1956-1963

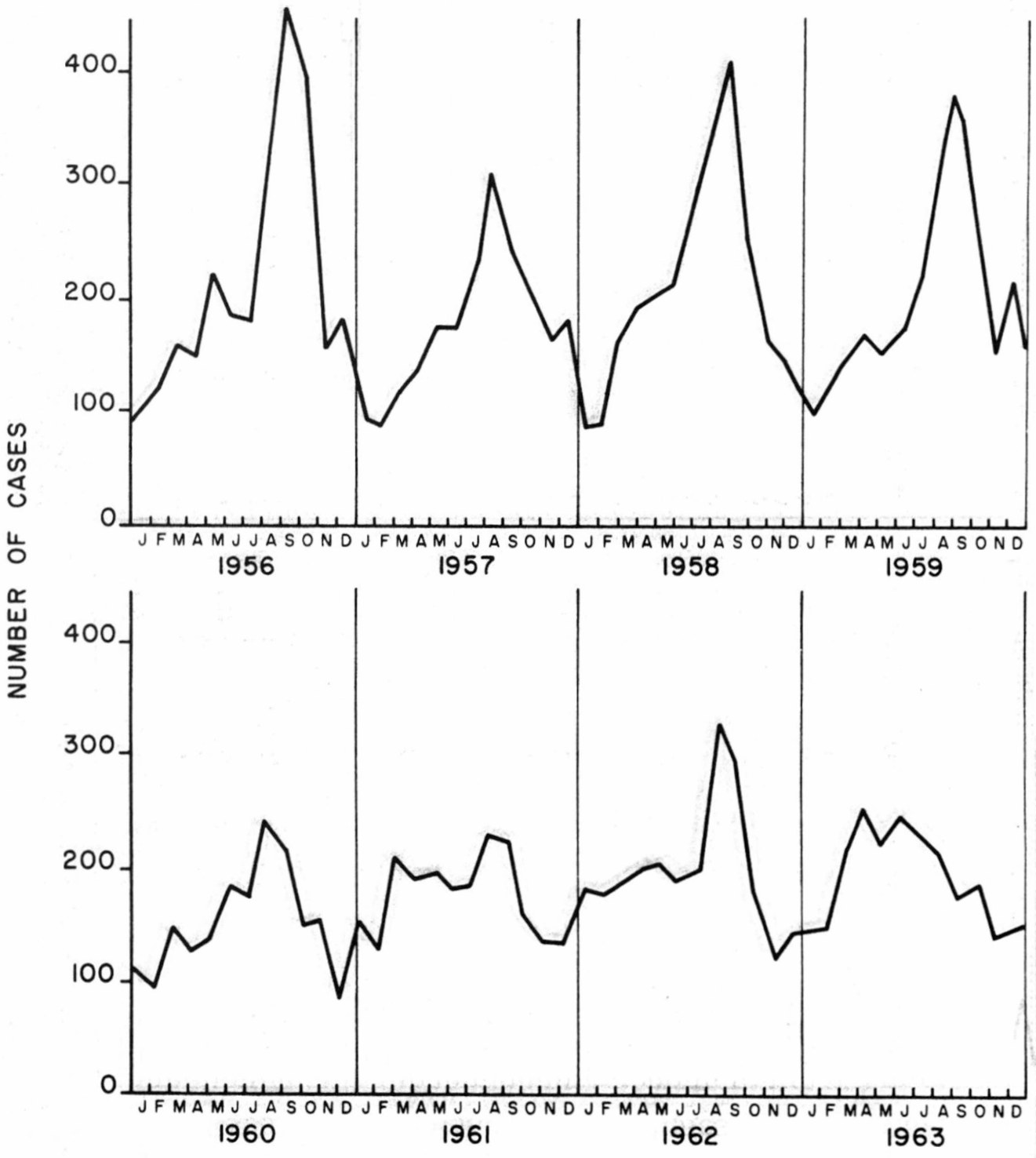


Table 1

Cases of Encephalitis
Reported to the Encephalitis Surveillance Unit*
1963

Etiology	Number of Cases		Percent Cases	
Post-infectious Encephalitis		1194		50.6
Mumps	671		28.4	
Measles	239		10.1	
Varicella	84		3.6	
Influenza	30		1.3	
Post Vaccinal	3		0.1	
Other	167		7.1	
Primary Encephalitis		1168		49.4
Arthropod-borne	76		3.2	
Etiology Unknown	1092		46.2	
TOTAL		2362		100.0

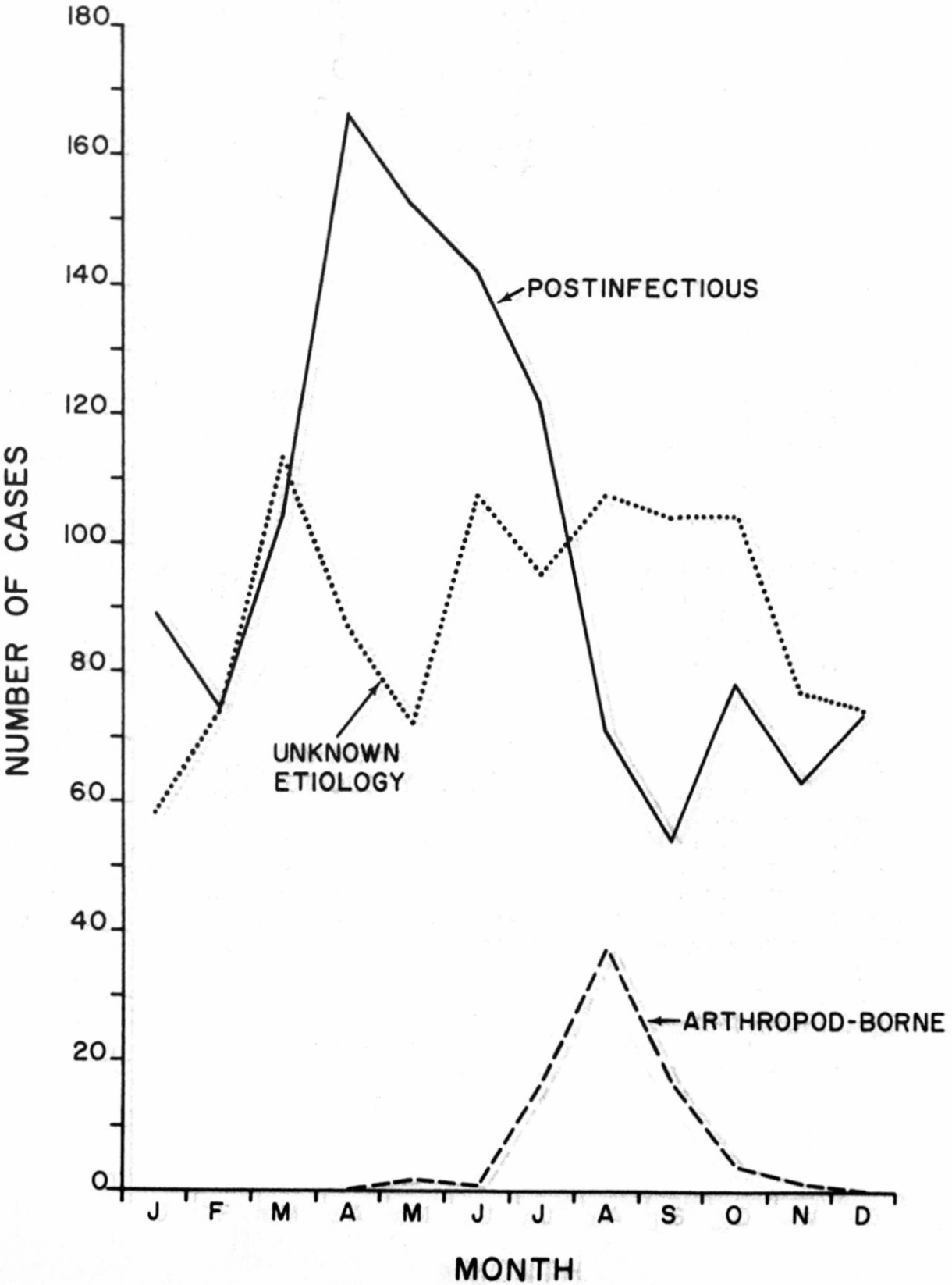
* The total based on weekly telegraphic reporting in 1963 was 1,993 cases. As in previous years, the annual total submitted by the States to the ESU is somewhat greater. This is principally due to the fact that many reporting states have in the past not included reports of post-infectious encephalitis in weekly telegraphic reports.

The cases reported to the ESU for the years 1956-1963 are shown graphically by month in Figure 1. The usual pattern in previous years has been an increase in cases in March or April followed frequently by a major peak in the late summer. Further analysis of the reported cases by etiology has shown the rise in cases in the spring to be due largely to the increased incidence of post-infectious cases and the late summer peak to correspond with the period of increased arthropod-borne virus activity. In 1963, however, there was no late summer peak; the highest incidence of encephalitis cases occurred during the April-July period.

Figure 2 graphically depicts the occurrence of encephalitis cases during 1963 by three broad diagnostic groups: post-infectious, arthropod-borne and unknown etiology. The post-infectious cases demonstrate their expected spring rise; the few cases ascribed to

Figure 2

REPORTED CASES OF ENCEPHALITIS BY ETIOLOGIC GROUP AND MONTH OF ONSET, 1963



arthropod-borne viruses show a late summer and fall incidence; those of unknown etiology describe an erratic pattern. The data upon which this figure is based is shown in Table 3:

Table 3

Reported Cases of Encephalitis by Month According to Etiology

Month	Total Cases Reported	Post-Infectious Encephalitis	Primary Encephalitis	
			Arthropod-borne	Unknown Etiology
January	147	89	0	58
February	148	74	0	74
March	217	104	0	113
April	253	166	0	87
May	225	152	1	72
June	249	142	0	107
July	233	121	17	95
August	215	71	37	107
September	174	54	16	104
October	186	78	4	104
November	141	63	1	77
December	147	73	0	74
Unknown	27	7	0	20
Total	2362	1194	76	1092

A. Post-infectious Encephalitis

Of the 2,362 cases of encephalitis with onsets of illness in 1963, there were 671 reported due to mumps, 239 due to measles, 84 due to varicella and 40 due to influenza. The monthly incidence of encephalitis attributed to these agents is depicted in Figure 3. Other infectious agents were thought to have accounted for 17 cases, including Herpes (3), Pertussis (1), Coxsackie A-9 (1), Coxsackie B-2 (1), and Lymphocytic Choriomeningitis (2). A comparison with the experience of the previous 3 years is presented in Table 4.

Figure 3

POSTINFECTIONS ENCEPHALITIS

ASSOCIATED WITH MEASLES, MUMPS, VARICELLA AND INFLUENZA
BY MONTH OF ONSET, 1963

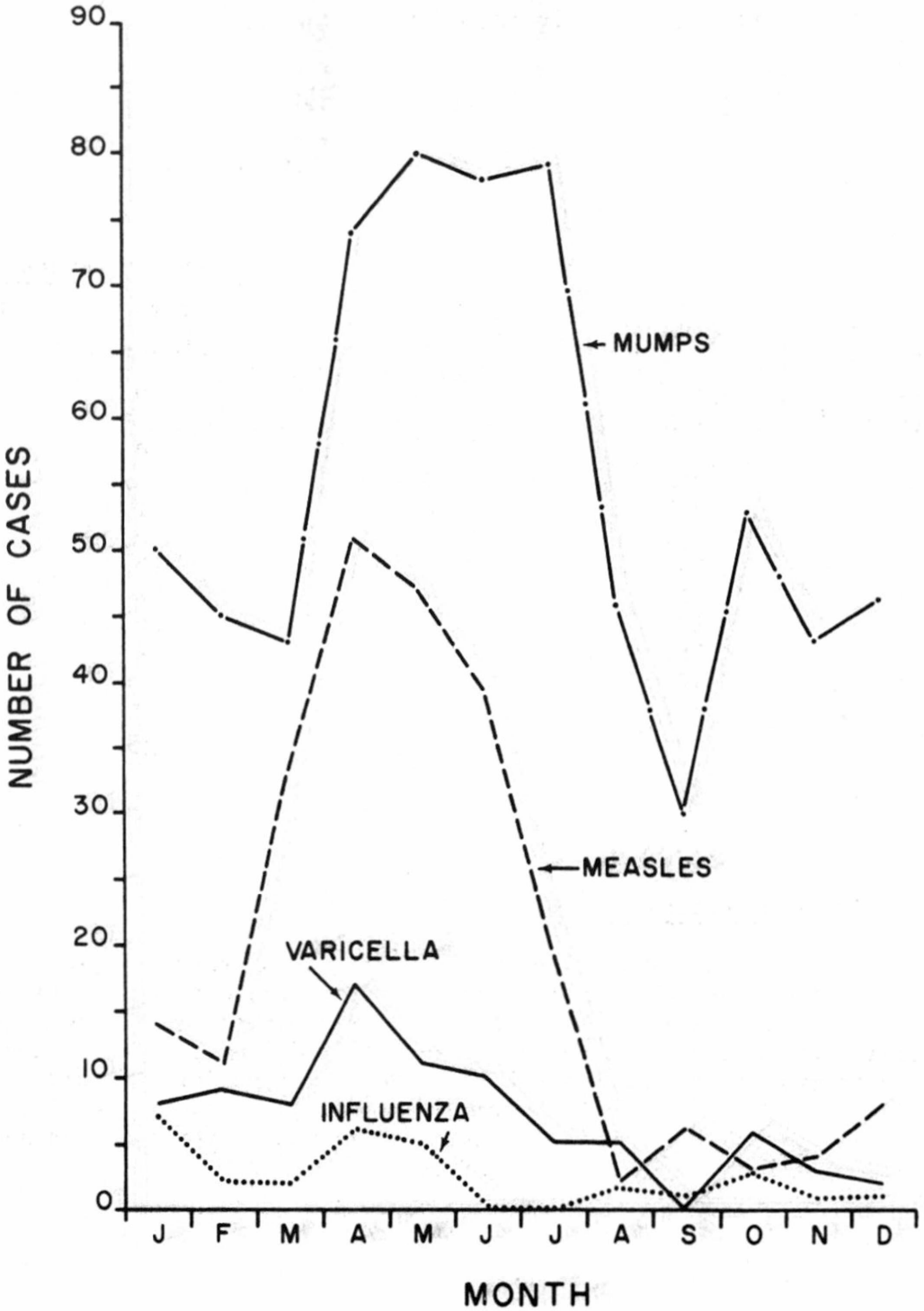


Table 4

Cases of Commonly Reported Post-Infectious Encephalitis by Etiology, 1960-1963

Year	Etiology				
	Measles	Mumps	Varicella	Influenza	Post Vaccinal
1960	299	700	95	24	--
1961	276	402	75	8	8
1962	337	358	76	40	7
1963	239	671	84	30	3

Mumps Encephalitis

Of the 1,194 cases of post-infectious encephalitis reported by etiology, 671 (56.2 percent) were ascribed to mumps. Although mumps has been the most frequent cause of encephalitis for the past 4 years, there has been marked variation in the yearly incidence as noted in Table 4. Since mumps is not a nationally reportable disease it is unknown as to whether these changes correlate with yearly fluctuations in the incidence of the disease. The total of 671 cases in 1963 exceeds the 1962 total by over 300 cases; the greatest increases occur in California and Florida. As shown in Table 5, the increase in mumps encephalitis in these 2 states was disproportionately large compared to the rise in reported cases of mumps.

Table 5

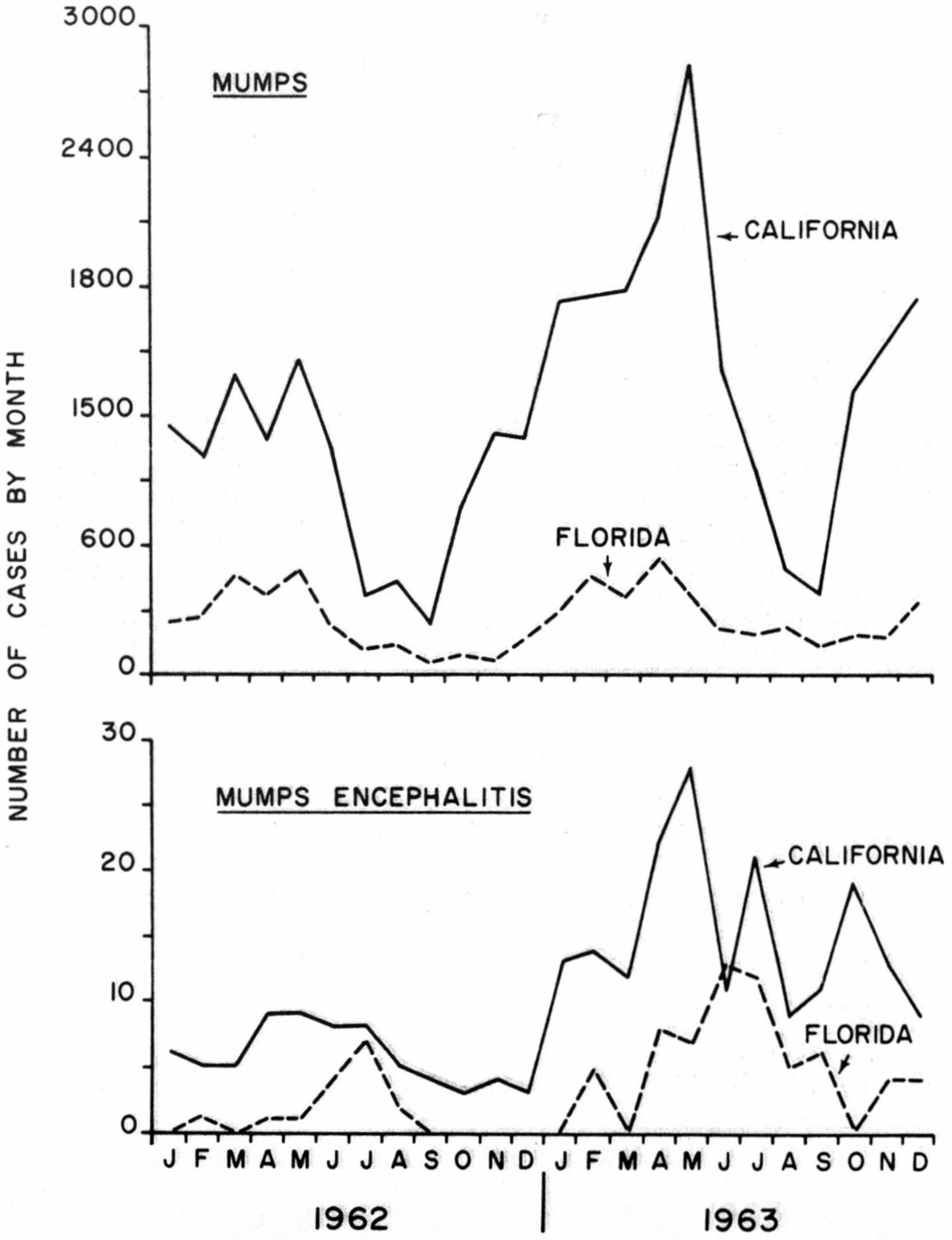
Reported Cases of Mumps and Mumps Encephalitis in California and Florida for 1962 and 1963

	1962		1963	
	Mumps	Mumps Encephalitis	Mumps	Mumps Encephalitis
Calif.*	11,510	69	18,100	186
Florida**	2,798	16	3,603	64

* From California Morbidity (Weekly)
** Florida State Board of Health Weekly Report of Common Communicable Disease

Figure 4

REPORTED CASES OF MUMPS AND MUMPS ENCEPHALITIS
CALIFORNIA AND FLORIDA
1962 – 1963



In Figure 4, cases of mumps and mumps encephalitis in California and Florida are shown by month for 1962-1963. In California, the peak occurrence of cases of mumps encephalitis follows by about one month the peak in reported cases of mumps. In neither state, however, do the curves generally correspond so closely as might be anticipated.

Measles Encephalitis

Reported post-infectious encephalitis due to measles has been relatively constant during the past 4 years varying from the 1962 high of 337 to the 1963 low of 239 cases. The decrease in 1963 is associated with a drop in the reported cases of measles from 481,530 cases in 1962 to 385,156 in 1963. Deaths due to measles encephalitis accounted for almost half (30/63) the reported deaths ascribed to cases of encephalitis with known etiology.

Varicella Encephalitis

Reported post-infectious encephalitis due to varicella has not varied significantly during the past 4 years ranging from 75 to 95 cases. Eighty-four cases, including 21 deaths, were reported in 1963.

Influenza Encephalitis

Reported post-infectious encephalitis attributed to influenza in 1963 does not reflect the epidemic of influenza A_2 which occurred during the first three months of 1963. In fact, a slight decrease from 40 cases in 1962 to 30 cases in 1963 is noted.

Post Vaccinal Encephalitis

Three reported cases of post vaccinal encephalitis, including one fatality, occurred following smallpox vaccination. No cases of encephalitis following rabies vaccination were reported.

B. Arthropod-Borne Encephalitis

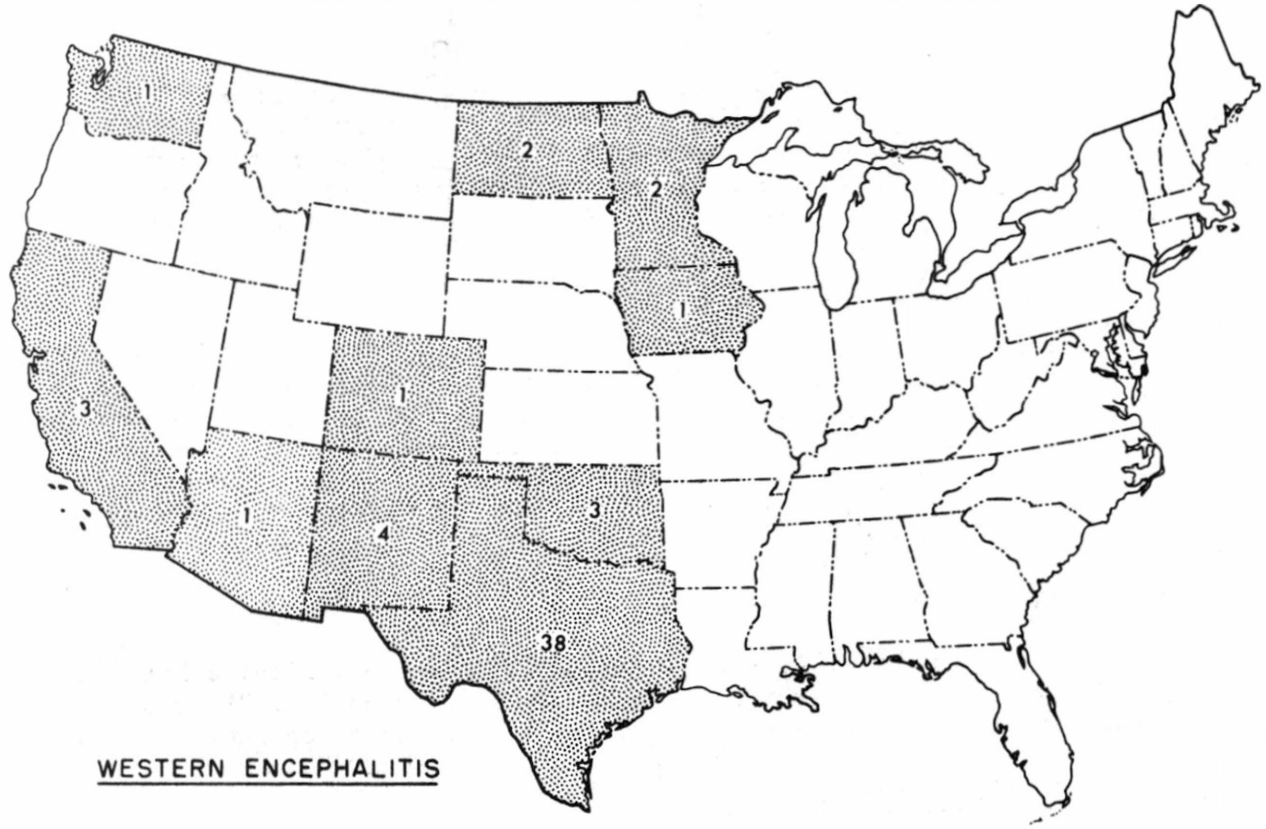
Cases reported to the Encephalitis Surveillance Unit have been classified, as last year, into "confirmed" and "presumptive" categories.

"Confirmed Cases" fulfill any one of the following criteria:

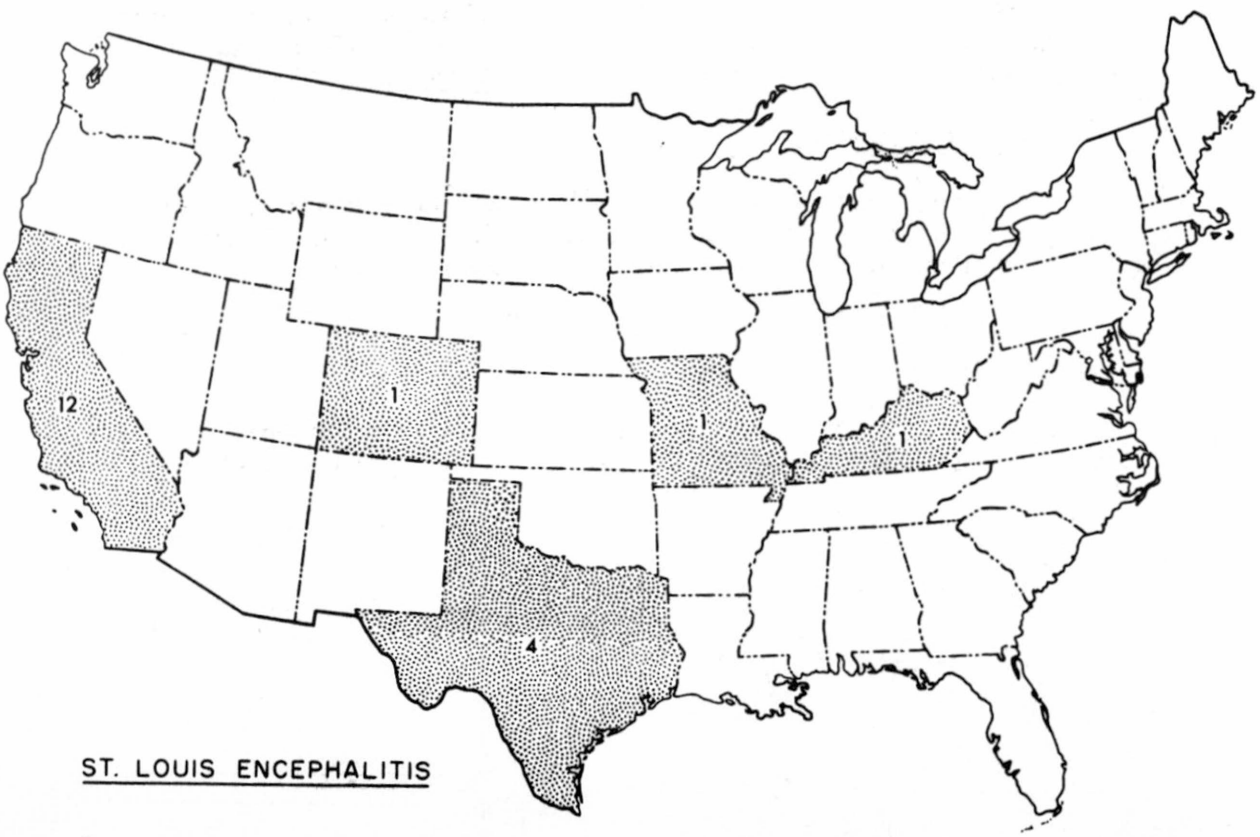
1. Isolation of the virus.
2. A fourfold rise in antibody titer between acute and convalescent specimens.

Figure 5

GEOGRAPHIC DISTRIBUTION OF HUMAN CASES
OF ARTHROPOD-BORNE ENCEPHALITIS-1963



WESTERN ENCEPHALITIS



ST. LOUIS ENCEPHALITIS

3. A fourfold fall in antibody titer between acute and convalescent specimens.
4. A single significant titer of 1:8 or greater of complement fixing antibodies, or 1:320 or greater hemagglutination inhibition antibodies, during an epidemic.

"Presumptive Cases" fulfill any one of the following criteria:

1. A single significant titer of complement fixing or hemagglutination inhibiting antibodies, (as in 4 above) in an individual with clinical encephalitis.
2. History of clinical encephalitis in an area of concurrent epidemic, but without laboratory confirmation.
3. Pathological evidence by autopsy of encephalitis during an epidemic.

Seventy-six confirmed or presumptive cases of arthropod-borne encephalitis with onsets of illness in 1963 were reported to the ESU. There were no recorded human deaths. Of the 76 cases, Western Encephalitis accounted for 56, St. Louis Encephalitis for 19, and California Encephalitis for one. No human cases of Eastern Encephalitis were reported. The total number of human WE and SLE cases in each State is shown in Figure 5. Table 6 summarizes the occurrence of arthropod-borne encephalitis by etiology for the past 9 years.

Table 6

Human Arthropod-Borne Encephalitis Reported to the Encephalitis Surveillance Unit 1955-1963

Year	Etiology			Total
	WE	EE	SLE	
1955	37	15	107	159
1956	47	15	563	625
1957	35	5	147	187
1958	141	2	94	237
1959	14	36	118	168
1960	21	3	21	45
1961	27	1	42	70
1962	17	0	253	270
1963	56	0	19	76*

* One case of California Encephalitis reported from Florida is included in the total.

(1) Human Cases

Western Encephalitis (WE)

The 56 reported cases of Western Encephalitis represent the second highest annual total reported since the Encephalitis Surveillance Unit was established in 1955. The only year exceeding this total was 1958 when 141 cases of WE were reported. A line listing of the cases is included in Appendix A on pages 31 and 32.

Of the 56 cases, 38 occurred in the high plains area of Texas, which represented the only concentration of arthropod-borne encephalitis in the United States in 1963. This outbreak is the subject of a special report in Section III.

The distribution of cases by age and sex is shown in Table 7. As in previous years, Western Encephalitis occurred primarily among the younger age groups with 18 cases (35.3 percent) occurring in children 0-4 years of age and 30 cases (58.9 percent) occurring in children less than 15 years of age. A slight male predominance, 32 of 56 cases, is noted. Table 8 shows the seasonal incidence of WE and demonstrates the usual late summer peak.

Eastern Encephalitis (EE)

For the second consecutive year no human cases were reported.

St. Louis Encephalitis (SLE)

The 19 reported cases of St. Louis Encephalitis represent the lowest reported annual total for this disease since the establishment of the Encephalitis Surveillance Unit in 1955. A line listing of the cases appears in Appendix B on page 33. In contrast to 1962 when a large outbreak occurred in the Tampa Bay area of Florida, no concentration of cases was noted in 1963. Distribution of cases by age and sex is shown in Table 7. Although over half the cases occurred in persons 30 years of age or older, almost one-third of the cases occurred among children less than 10.

Table 7
Confirmed and Presumptive Human Cases of
Arthropod-Borne Encephalitis by Age and Sex, 1963*

Age Group	SLE			WE		
	Male	Female	Total	Male	Female	Total
0-4	1	2	3	8	10	18
5-9	2	1	3	6	0	6
10-14	0	1	1	3	3	6
15-19	0	0	0	1	1	2
20-29	1	1	2	4	4	8
30-39	2	2	4	1	2	3
40-49	4	0	4	1	0	1
50-59	0	1	1	2	2	4
60-69	0	1	1	2	0	2
70 & over	0	0	0	0	1	1
Unknown	0	0	0	4	1	5
Total	10	9	19	32	24	56

* One case of California Encephalitis reported from Florida is not included in this table.

Table 8
Human Cases of Arthropod-Borne Encephalitis
by Month, 1963*

Month Of Onset of Illness	SLE No. of Cases	WE No. of Cases	Total
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	1	1
June	0	0	0
July	1	16	17
August	5	31	36
September	8	8	16
October	4	0	4
November	1	0	1
December	0	0	0
Total	19	56	75

* One case of California Encephalitis reported from Florida is not included in this table.

(2) Non-Human Arbovirus Isolations

In addition to the reporting of human cases, the Encephalitis Surveillance Unit attempts to maintain as complete a record as possible of non-human isolates of arboviruses. This information is furnished by various state health departments, laboratories and individual investigators as well as Public Health Service facilities.

A summary of non-human isolates during 1963 appears in Appendix C. Isolates have been listed by species according to state. Noteworthy are: 1) the isolation of the Venezuelan Equine Encephalitis virus from mosquitoes in the Florida Everglades. This is the first time that this virus has been isolated in the United States and is the subject of a special report in Section III; 2) thirty-seven isolations of Western Encephalitis virus from 3 genera of snakes caught in Utah. Findings recently reported by Gebhardt, et al.* suggest that these reptiles may be significant over wintering hosts for the Western Encephalitis virus.

* Gebhardt, L. P., New England J. Med. 271:172-177, 1964.

III. SPECIAL REPORTS

A. Encephalitis Outbreak Due to Multiple Etiologic Agents, Including Western Encephalitis, Hale County, Texas, 1963

An outbreak of more than 70 cases of clinical encephalitis, including 4 deaths, occurred during the late summer and early fall months of 1963 in the Texas High Plains area. Of these, 57 cases, including 2 deaths, occurred in Hale County which perennially has experienced endemic encephalitis. Its last major outbreak, in 1956, was caused by St. Louis Encephalitis.

The first Hale County case occurred in late June and was followed by a build-up of cases in July. Following a peak during the first three weeks of August, the occurrence of cases fell off rapidly and only 6 cases were reported after September 1. During July and August, 33 suspect cases of horse encephalitis were reported in and around Hale County.

Classification of the Cases

During the epidemic 80 suspect cases of encephalitis were investigated in Hale County. Fifty-seven of these were judged by the

investigating team to have clinical encephalitis (febrile illness with evidence of cortical brain impairment); sera were collected from 51 cases for antibody determinations.

The ESU criteria for classification of arthropod-borne encephalitis were used with the following modification: Cases over one year of age with an HI titer of 1:320 or greater and/or a CF titer of 1:8 or greater were classified as "presumptive" only. Cases with HI titers of 1:80 or 1:160 were designated "equivocal".

Using these criteria, 27 cases were classified as "confirmed or presumptive" Western Encephalitis (WE) and 2 were classified as "equivocal" WE.* There were no "confirmed or presumptive cases" of St. Louis Encephalitis, although 2 cases were classified as "equivocal" SLE. The 20 remaining cases could not be confirmed by laboratory means. These sera were tested against numerous other arthropod-borne viral agents, including EE, California and Tensaw, with negative results. The classification of cases is summarized in the following table:

Classification of Cases
Hale County, Texas

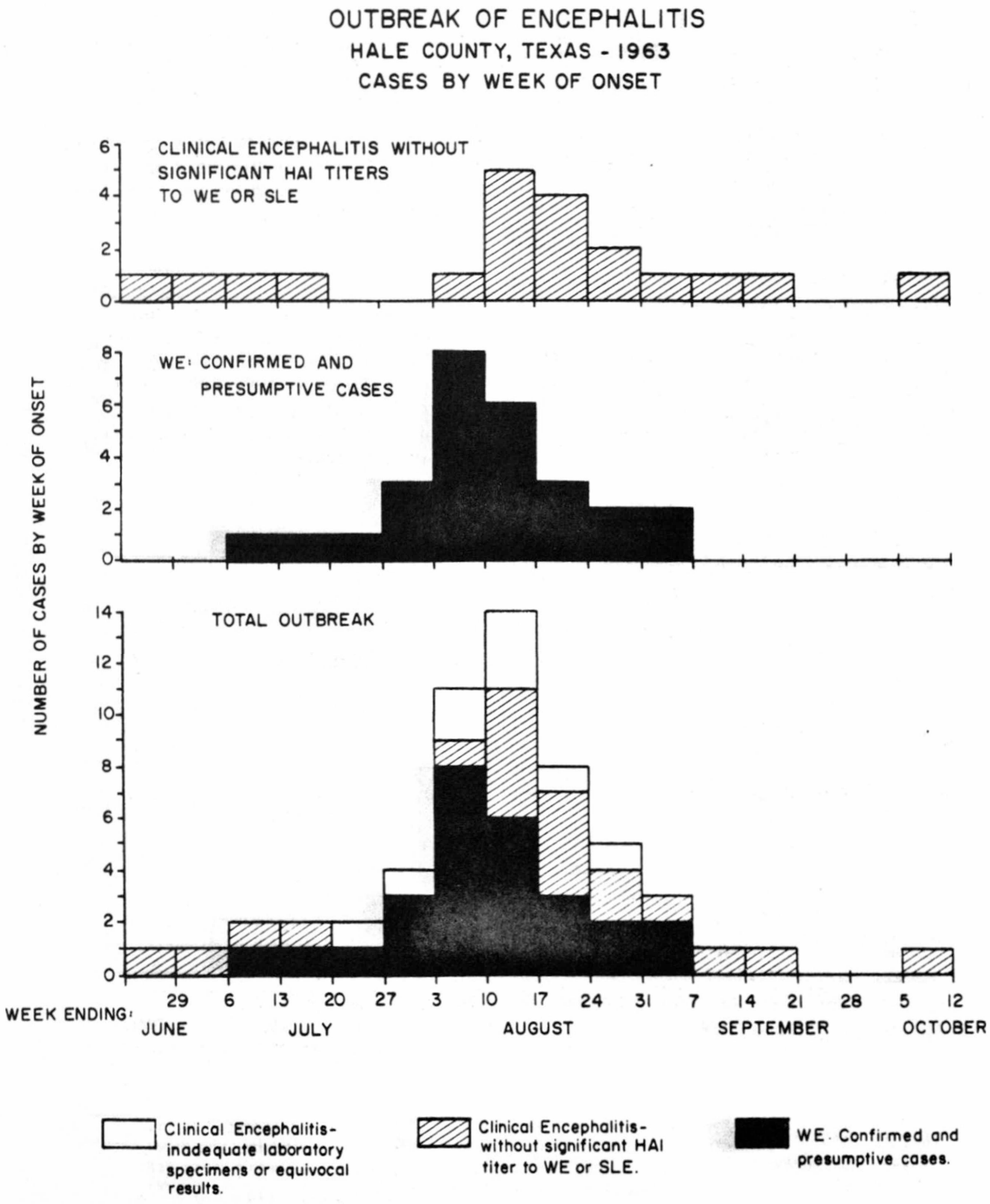
	Confirmed or Presumptive	Equivocal	Total
WE	27	2	29
SLE	0	2	2
Negative serologically	0	0	20
Total	27	4	51

Attempts to isolate enteroviruses from a small number of stool specimens collected from the cases were unsuccessful. A sampling of paired sera were tested against mumps and certain enterovirus antigens (Echo 2, Coxsackie A-9, B-3, B-5, B-6) with negative results.

Neither of the 2 deaths in Hale County had laboratory studies.

* 24 "confirmed or presumptive" WE cases in Hale County appear in Table 10; the additional 3 cases in this epidemic report were confirmed following the preparation of Section II of this surveillance report.

Figure 6


OUTBREAK OF ENCEPHALITIS
HALE COUNTY, TEXAS - 1963
CASES BY WEEK OF ONSET
CLINICAL ENCEPHALITIS WITHOUT SIGNIFICANT HAI TITERS TO WE OR SLE
WE: CONFIRMED AND PRESUMPTIVE CASES
TOTAL OUTBREAK
NUMBER OF CASES BY WEEK OF ONSET
WEEK ENDING:
29 6 13 20 27 3 10 17 24 31 7 14 21 28 5 12
JUNE JULY AUGUST SEPTEMBER OCTOBER
Clinical Encephalitis- inadequate laboratory specimens or equivocal results.
Clinical Encephalitis- without significant HAI titer to WE or SLE.
WE. Confirmed and presumptive cases.

Epidemiologic Characteristics

The "confirmed and presumptive" cases of WE and the cases of clinical encephalitis with negative serological evidence for acute WE or SLE infection are shown by week of onset in Figure 6. In both groups sporadic cases occurred in July followed by the peak incidence of cases during August. The peak incidence of WE cases, 8, occurred during the week ended August 10, one week earlier than the peak incidence of cases without significant antibodies for WE or SLE infection.

The 47 cases in these two categories are shown by age and sex and by urban-rural distribution in Table 9 on page 20. The two groups show dissimilar patterns. The WE group shows a predominance of cases among males and in rural areas as well as a high attack rate among children. The group without significant antibodies to WE or SLE also shows a slight male predominance but has a higher attack rate among urban dwellers and shows no marked age specificity. Clinically, the two groups were indistinguishable. Thus, epidemiologic data and laboratory data suggest that more than one etiologic agent may have been responsible for the outbreak.

Non-Human Isolations and Serological Studies

Mosquito collections showed a predominance of C. tarsalis (the presumed vector for WE) during the period of the outbreak. WE virus was isolated from 58 percent of the mosquito pools collected from August 19-22 and from 29 percent of those collected from August 23-27. By the first week in September, the percentage of pools positive for WE had dropped to 13 percent and during the following month less than one percent contained WE virus.

SLE virus was isolated at least twice from mosquito pools; 4 other isolates are under study. Five additional isolates appear to be related to an unidentified arbovirus first isolated in 1961 from 6 pools of Texas mosquitoes, and subsequently isolated from 4 more pools in 1962. Twenty-two isolates appear to be unrelated to any of the other viruses, but appear to be related to each other. In view of the possibility that more than one encephalitis virus was active in the outbreak, these mosquito isolates are being tested against acute and convalescent human sera.

Sentinel chickens maintained in Hale County during the 1963 outbreak were found to have HI antibody to WE virus in from 75 to 97 percent of the chickens in four flocks. The frequency of WE-positive chickens was not significantly higher than for the past several years in the same area.

Table 9

Encephalitis, Hale County, Texas 1963

Cases by Age and Sex

Age	Population*	Confirmed or Presumptive WE				Clinical Encephalitis Without Significant Antibodies to WE or SLE			
		M	F	Total	Case Rate**	M	F	Total	Case Rate**
0-4	4704	5	6	11	234	1	1	2	43
5-9	4495	4	0	4	89	2	2	4	89
10-19	7010	2	0	2	29	2	2	4	57
20-29	4798	2	3	5	104	3	2	5	104
30-39	4546	2	1	3	66	2	1	3	66
40-59	7455	2	0	2	27	1	0	1	13
60+	3790	0	0	0	0	1	0	1	26
Total	36798	17	10	27	73	12	8	20	54

Urban - Rural Distribution of Cases

	Population*	Confirmed or Presumptive WE		Clinical Encephalitis Without Significant Antibodies to WE or SLE	
		Number	Case Rate**	Number	Case Rate**
Urban	18735	7	37	14	75
Rural	18063	18	100	5	28
Unk.		2		1	
Total		27		20	

* 1960 Census

** Per 100,000 population

Reported by:
Texas State Department of Health
James E. Peavy, M.D., M.P.H., Commissioner of Health
Van C. Tipton, M.D., M.P.H., Director Communicable Disease Control Division
J. V. Irons, Sc.D., Chief of Laboratories
Disease Ecology Section, Technology Branch, CDC
Dr. Archie D. Hess, Chief
Dr. Preston Holden, Veterinarian
Dr. Louis C. LaMotte, Research Microbiologist
Dr. George W. Sciple, Medical Ecologist
Mr. D. Bruce Francy, Entomologist
Surveillance Section, Epidemiology Branch, CDC
Dr. Pierce Gardner, Chief, Encephalitis Surveillance Unit

B. California Encephalitis - Case Report: Florida, 1963

For the first time since the establishment of the Encephalitis Surveillance Unit in 1955, a case of human encephalitis due to the California Encephalitis has been reported. The case occurred in a 12 year old white female from Pinellas County, Florida, and was well documented through studies done at the Tampa Bay Regional Encephalitis Laboratory. The case history and laboratory results which appear below were reported by Dr. James O. Bond, Director, and Dr. Donald T. Quick, EIS Medical Epidemiologist, Tampa Bay Regional Encephalitis Laboratory, Florida State Board of Health and by the University of Pittsburgh Graduate School of Public Health, Department of Epidemiology and Microbiology, Dr. William McD. Hammon, Director.

CASE HISTORY

A 12 year old white female was hospitalized in Dunedin, Florida, on August 22, 1963. She had been in excellent health until 24 hours before admission at which time she was "feverish" although her temperature was not recorded. On the morning of admission, she was found on the floor next to her bed, convulsing. Convulsions were described as "jerking movements" most marked on the left side. There was no associated incontinence, sialorrhea or tongue biting.

On admission she was comatose. Rectal temperature was 102°F, pulse 120/min., respirations 24/min. and BP 160/100. Intermittent myoclonus of the eyes with spread to the left face, left arm and occasionally both legs was observed in the hospital. Bilateral papilledema, flaccid left extremities, absent superficial and deep

tendon reflexes and a positive Babinski on the right side were outstanding findings on physical examination.

Her past medical history was not contributory. The patient had had measles, mumps and chicken pox as mild illnesses without sequelas.

Outstanding laboratory studies included a CSF on the day of admission with opening pressures of 480 mm CSF, with 243 cells (all lymphocytes) and a protein of 91 mg/100 ml. On August 29, her ninth day of illness, the spinal fluid pressures were 268 mm CSF opening and 220 mm closing with 87 cells (all lymphocytes) and a protein of 68 mgm/100 ml. Cultures were negative. Other studies including serum electrolytes, calcium and urea nitrogen; carotid arteriograms and pneumoencephalogram were within normal limits. An electroencephalogram showed dysrhythmic activity without focus or localization.

Progressive recovery characterized the hospital course with discharge on September 9, 1963. Follow-up studies for sequelae have been negative except for mild emotional lability and increased fatiguability.

Serologic Studies: California (BFF 283) antigen used in all tests.

Serum Specimen	HI	CF	Neut. Indices
One Day After Onset	1:10	<1:4	<0.5
15 Days After Onset	1:40	<1:4	3.0
29 Days After Onset	1:160	1:16	3.5
110 Days After Onset	1:40	1:32	2.9

Acute and convalescent sera were negative for EE, WE, SLE and Tensaw antigens.

C. Venezuelan Equine Encephalitis Virus Isolation - Florida

Venezuelan Equine Encephalitis virus was recovered from mosquitoes in the Florida Everglades on four separate occasions in 1963. Single isolations were made from a mosquito pool of Culex (Melanoconion) sp. in each of 3 months (June, July and October) and one isolation was

made from a mosquito pool of Aedes taeniorhynchus in July. Although previous serologic studies indicated the presence of antibodies to VEE in humans (Seminole Indians) in the Florida Everglades, this represents the first recovery of the VEE virus in the United States.

(Reported by Dr. Roy Chamberlain, Chief, Virus Vector Laboratory, Arbovirus Unit, Virology Section of the Laboratory Branch, Communicable Disease Center.)

Editor's Note: To date no human cases of Venezuelan Equine Encephalitis have been reported by the states to the Encephalitis Surveillance Unit. The usual 1 to 3 day illness with mild respiratory symptoms is difficult to diagnose clinically outside of an epidemic situation and it is possible that unrecognized human cases have occurred. Of some concern is the isolation of VEE virus from Aedes taeniorhynchus which is a pest mosquito abundant in the coastal regions of the Southeastern United States.

IV. FOREIGN REPORTS

A. Simultaneous Outbreaks of Western Encephalitis and Central Nervous System Illnesses Associated with Other Neurotropic Viruses - Saskatchewan, Canada, 1963

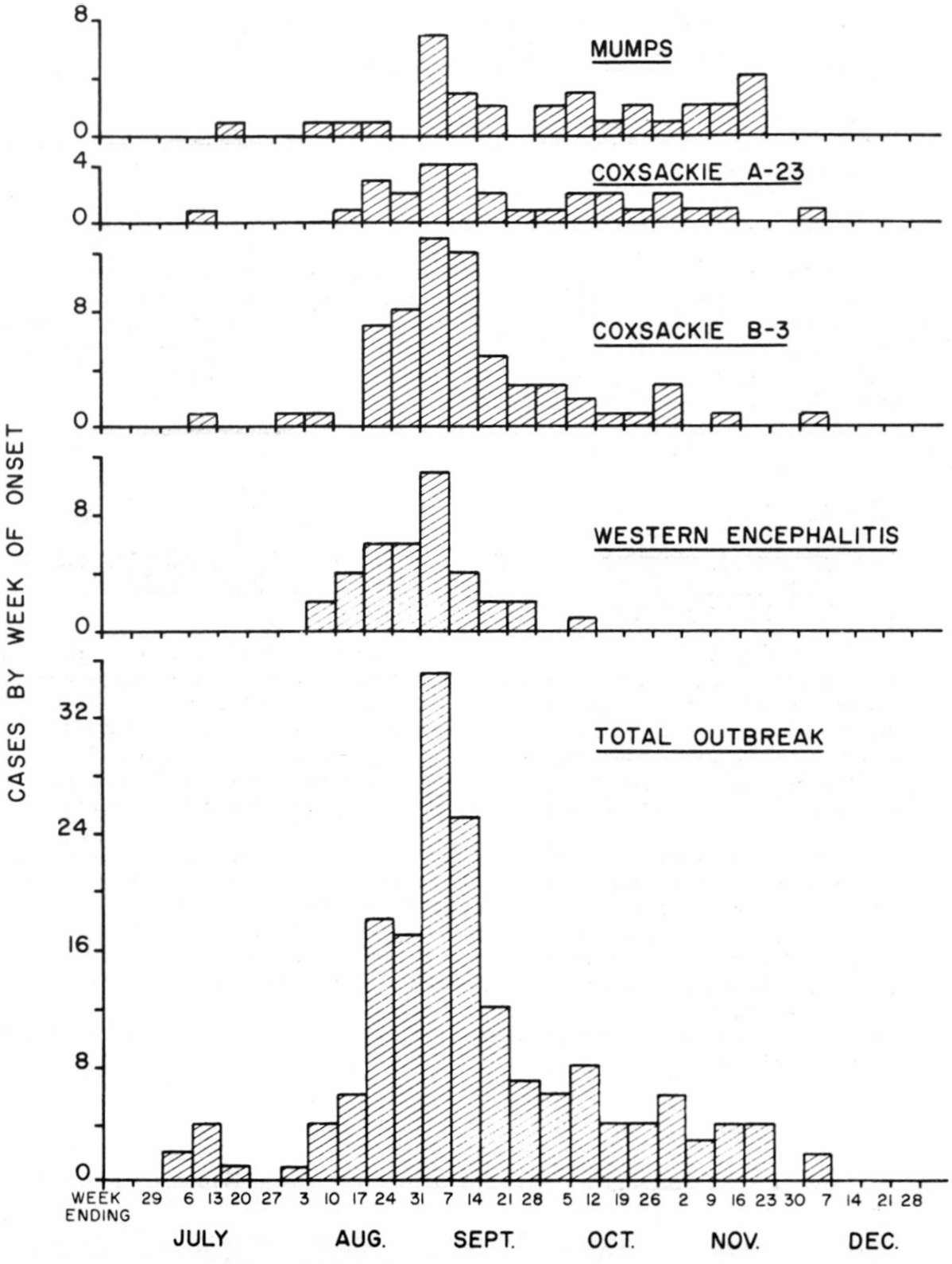
During 1963, 38 human cases of laboratory confirmed Western Encephalitis occurred in Saskatchewan between August 9 and September 12. There were 3 deaths. The initial two cases during the second week of August were followed by a gradual buildup during August reaching a maximum of 11 cases for the week ended September 7 (See Figure 7). Following this peak there was a rapid fall off in cases with only eight cases reported during September and a final case in early October.

Six cases of confirmed WEE, including the three deaths, occurred in persons over the age of 50. Ten cases occurred in infants. Males accounted for 26 of the 38 confirmed cases. Western Encephalitis virus was recovered from the spinal fluid of an elderly man who subsequently died, and also from a throat swab from a two year old girl. In the remaining 36 cases, the diagnosis was made on the basis of a rise in complement fixation titer to WE. In addition to the cases with laboratory studies, a number of clinical illnesses thought to be Western Encephalitis were observed.

Figure 7

OUTBREAK OF WESTERN ENCEPHALITIS AND CNS ILLNESSES ASSOCIATED WITH OTHER NEUROTROPIC VIRUSES

SASKATCHEWAN - 1963



In 1963, the warm and wet spring and early summer in Saskatchewan provided ecological conditions which were favorable to the propagation of mosquitoes. The activity of female mosquitoes was described as "extraordinary" and C. inornata, A. dorsalis, and C. tarsalis were present in increased numbers. WE virus was repeatedly isolated from mosquito pools collected over a wide area of the province. On July 15, Dr. H. O. Dillenberg, Provincial Epidemiologist, brought these facts to the attention of the medical profession indicating that cases of human Western Encephalitis might be expected.

An epizootic of horse encephalitis appeared in and around Regina during the latter half of July. During August and September increasing numbers of sick and dying horses were reported from all parts of the province. By the time the epizootic had abated in October, 279 cases, including 47 deaths, had been reported to the Health Department.

In order to estimate the prevalence of inapparent human WE infections, a comparative study was conducted utilizing blood samples submitted for marriage certificates. Pre- and post-epidemic specimens from an epidemic region (Weyburn-Estevan) were compared with comparable specimens taken from a district (Outlook) where no outbreak occurred. The results indicate a high degree of inapparent infection:

Rates of Complement Fixation Antibodies to Western Encephalitis Virus among Persons in an Epidemic Area Versus a Non-Epidemic Area

	Pre-Epidemic Spec. Jan.-July, 1963	Post-Epidemic Spec. Aug.-Dec., 1963
Epidemic Area (Weyburn-Estevan Region)	31/1744 (1.8%)	32/444 (7.2%)
Non-Epidemic Area (Outlook District)	7/351 (2.0%)	4/462 (0.9%)

In addition to the outbreak of Western Encephalitis, simultaneous outbreaks of at least three other potentially neurotropic viruses (Coxsackie B-3, ECHO 9, and mumps) occurred in Saskatchewan during the summer and fall of 1963. Many illnesses with central nervous system manifestations occurred during this period and in many of these cases an associated titer rise to one or more of these viruses was demonstrated. Several dual infections of WE and one of these other viruses were noted.

Dual infections of Coxsackie B-3, and ECHO 9 viruses were common. Other potentially neurotropic viruses, including herpes simplex and ECHO virus, other than type 9, were present but less active in Saskatchewan during this period. The occurrence of dual infections and the increased amount of viral activity tended to obscure the clinical patterns associated with the individual agents.

Coxsackie B-3

Sixty-three cases of Coxsackie B-3 infection were documented by viral isolation and/or neutralization titer rise. Although isolated cases were noted in June and early August, the majority of cases occurred during the latter part of August and September with the peak incidence of 13 cases having onset during the week ended September 7. Following this, the outbreak gradually diminished with sporadic cases occurring in November and December.

ECHO 9 (Coxsackie A-23)

Twenty-nine cases of ECHO 9 infection were documented by viral isolation and/or neutralization titer rise. A single case in early June was followed by a buildup of cases during the latter part of August reaching a peak of 4 cases for each of the first two weeks of September. This was followed by a gradual curtailment of cases during October and November.

Mumps

Thirty-three cases of laboratory confirmed mumps occurred simultaneously with the outbreaks. The first case in mid-July was followed by sporadic cases in August with the greatest number of cases occurring in September. As with the outbreaks of WE, Coxsackie B-3 and ECHO 9, the peak incidence (7 cases) occurred during the week ended September 7.

(Reported by Dr. H. O. Dillenberg, Provincial Epidemiologist, Saskatchewan Department of Health, Canada.)

B. Venezuelan Equine Encephalitis, Venezuela, 1963

The largest recorded epidemic of encephalitis during 1963 occurred in Venezuela where 9,591 human cases were reported, the majority occurring between mid-May and mid-November. The agent responsible for the outbreak was the Venezuelan Equine Encephalitis (VEE) virus.

Outbreaks began in the northwestern part of Venezuela and spread eastward across the country during the summer and fall months. Most outbreaks occurred in low altitude rural areas where VEE has been endemic. Although the majority of human cases suffered only the usual mild influenza-like illness lasting one to three days, a number of cases had severe central nervous system involvement and at least 49 deaths were recorded. A report midway through the outbreak indicated that 502 cases in equines, 423 fatal (84 percent), had been reported to the Venezuelan Health Ministry. The VEE virus was recovered from human cases and mosquitoes, as well as from donkeys and other equines.

(Reported by Dr. Ruth R. Puffer, Chief, Health Statistics Branch, Pan American Health Organization, Washington, D.C. and Dr. Telford Work, Chief, Virology Section of the Laboratory Branch, Communicable Disease Center.)

Editor's Note: VEE produces severe illness in horses but the disease in humans has usually been mild. The severe central nervous system involvement in a small percentage of cases and the occurrence of at least 49 fatal cases are unusual and worthy of note.

V. EQUINE VIRAL ENCEPHALITIS - UNITED STATES

A compilation of cases of equine encephalitis in the United States reported to the Animal Disease Eradication Division, USDA, has been provided by Dr. O. J. Hummon, Senior Staff Officer.

During 1963, 2426 cases, including 162 deaths, were reported among equines in the United States. Although this represents the largest recorded number of cases since 1953, vagaries in reporting practices make year to year comparisons difficult (See Figure 8). The largest numbers of cases were reported from the Midwest: Iowa (627 cases); Oklahoma (279 cases); Nebraska (228 cases); and Kansas (220 cases). The number of horses and mules affected and laboratory confirmation is presented in Table 10 by State. Laboratory confirmation of cases was sparse.

Table 10

EQUINE VIRAL ENCEPHALITIS REPORTED IN THE UNITED STATES
DURING CALENDAR YEAR 1963 (USDA)

State*	Equine Cases Reported: Number of Horses and Mules Affected	Number of Deaths	Number Confirmed by Laboratory	Serological Findings**: EEE	WEE	SLE	WEE/SLE	Calif.	Unk.
Alabama	10	10	3	3	-	-	-	-	-
Arizona	43	-	13	-	13	-	-	-	-
Arkansas	104	-	-	-	-	-	-	-	-
California	15	6	2	-	2	-	-	-	-
Colorado	78	13	-	-	-	-	-	-	-
Florida	52	51	-	-	-	-	-	-	-
Georgia	70	16	16	14	-	-	-	-	2
Idaho	8	1	8	-	4	-	-	-	4
Illinois	3	-	-	-	-	-	-	-	-
Iowa	627	2	-	-	-	-	-	-	-
Kansas	220	-	-	-	-	-	-	-	-
Louisiana	6	1	4	4	-	-	-	-	-
Maryland	2	1	-	-	-	-	-	-	-
Michigan	2	2	2	2	-	-	-	-	-
Minnesota	16	0	2	-	2	-	-	-	-
Mississippi	3	3	0	-	-	-	-	-	-
Missouri	19	1	7	-	7	-	-	-	-
Montana	116	-	-	-	-	-	-	-	-
Nebraska	228	-	-	-	-	-	-	-	-
Nevada	10	2	2	-	2	-	-	-	-
New Mexico	27	1	4	-	4	-	-	-	-
North Carolina	8	8	-	-	-	-	-	-	-
North Dakota	43	-	-	-	-	-	-	-	-
Ohio	5	5	-	-	-	-	-	-	-
Oklahoma	279	1	1	-	-	-	-	-	1

Table 10 (continued)

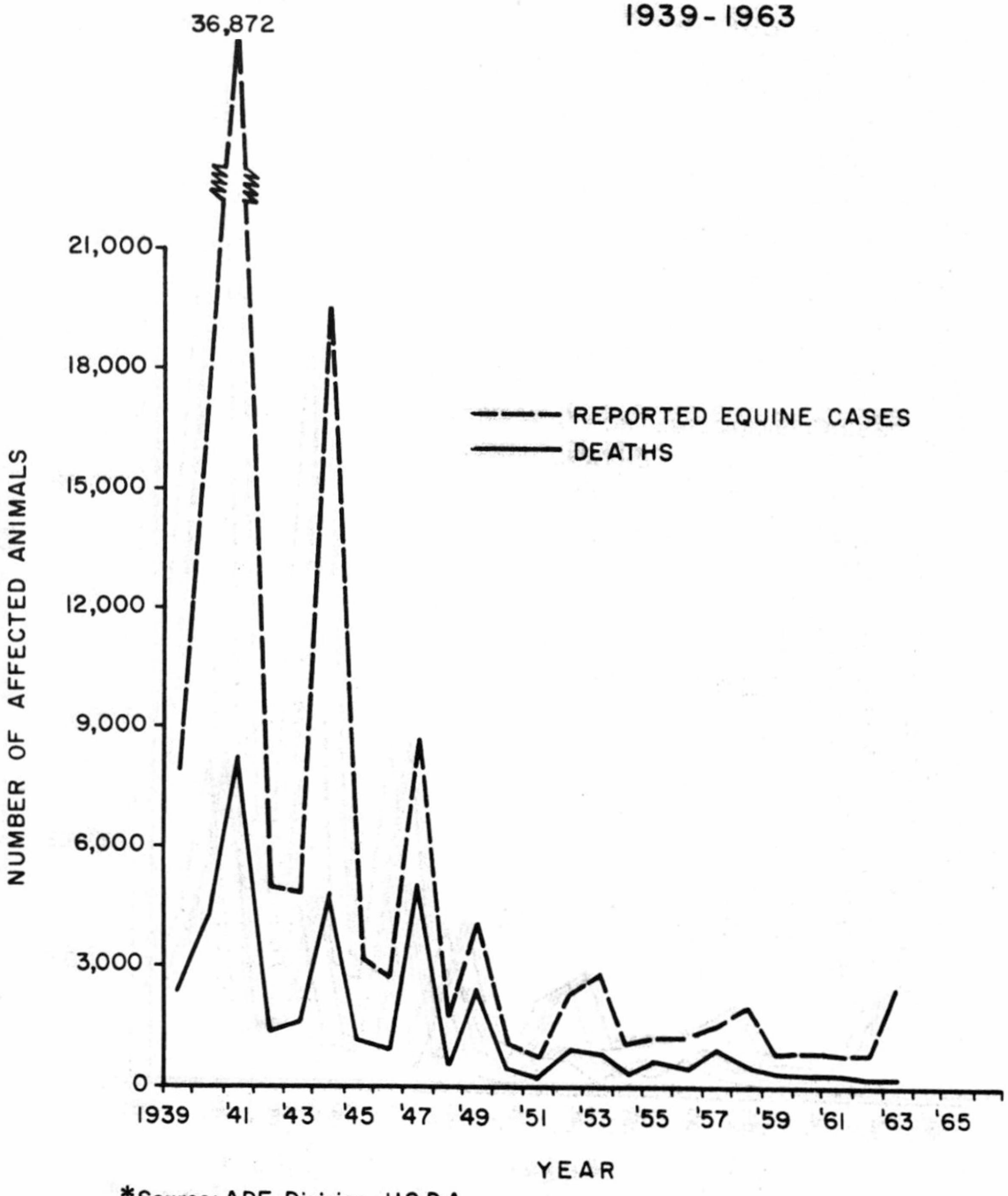
State*	Equine Cases Reported: Number of Horses and Mules Affected	Number of Deaths	Number Confirmed by Laboratory	Serological Findings**: EEE	WEE	SLE	WEE/SLE	Calif.	Unk.
Oregon	10	0	6	-	2	-	4	-	-
South Carolina	15	15	-	-	-	-	-	-	-
South Dakota	147	18	-	-	-	-	-	-	-
Tennessee	1	-	-	-	-	-	-	-	-
Texas	159	-	-	-	-	-	-	-	-
Utah	14	1	2	1	1	-	-	-	-
Virginia	3	3	-	-	-	-	-	-	-
Washington	8	1	8	-	3	2	2	-	1
Wisconsin	2	-	2	-	1	-	-	1	-
Wyoming	73	-	-	-	-	-	-	-	-
TOTAL	2,426	162	82	24	41	2	6	1	8

* 10 States reporting no cases are not shown.

** WEE - Western Equine Encephalitis strain
EEE - Eastern Equine Encephalitis strain
SLE - St. Louis Equine Encephalitis strain
Calif.- California Equine Encephalitis strain

Figure 8

ANNUAL MORBIDITY AND MORTALITY*
EQUINE VIRAL ENCEPHALITIS
1939-1963



*Source: ADE Division, USDA

Appendix A

CASES OF WE WITH 1963 ONSETS REPORTED TO ENCEPHALITIS SURVEILLANCE UNIT

State	County	Confirmed or Presumptive	Age	Sex	Onset	Test	Acute* Titer	Conv.* Titer	Lab.**
Ariz.	Apache	P	14	F	9-30	CF	8	None	SHD
Calif.	Kern	C	29d	F	7-24	CF	4	128	CDC
Calif.	Kern	P	26	F	7-63	CF	64	32	SHD
Calif.	Sacramento	C	57	M	8-15	CF	8	32	SHD
Colo.	Yuma	C	Adult	M	8-63	CF	40	1280	CDC
Iowa	Woodbury	C	25	M	9-63	CF	4	32	SHD
Minn.	Anoka	C	6mo	M	8-27	CF	Neg.	512	SHD
Minn.	Swift	P	10	M	9-25	CF	32	16	SHD
N.M.	Curry	P	Adult	M	9- 9	CF	8	16	SHD
N.M.	Curry	C	4	F	7-29	CF	8	64	SHD
N.M.	Dona Ana	P	Adult	M	7-29	CF	8	16	SHD
N.M.	Dona Ana	P	Adult	F	7- 9	CF	8	16	SHD
N.D.	Emmons	C	60	M	9-13	CF	Neg.	32	GFPHL
N.D.	McHenry	P	14	F	8-28	CF	4	8	GFPHL
Okla.	Oklahoma	P***	9	M	8- 2	Unk.	Not Specified		SHD
Okla.	Oklahoma	P***	21	M	8-11	Unk.	Not Specified		SHD
Okla.	Oklahoma	P***	8	M	5- 1	Unk.	Not Specified		SHD
Texas	Hale	C	5	M	7- 1	CF	8	32	SHD
Texas	Hale	C	4	F	7-14	CF	None	64	SHD
Texas	Lubbock	C	23	M	7-20	CF	64	32	SHD
Texas	Hale	C	34	M	7-20	CF	8	16	SHD
Texas	Floyd	C	12	M	7-23	CF	Neg.	128	SHD
Texas	Lubbock	C	10mo	F	7-24	CF	8	64	SHD
Texas	Hale	C	43	M	7-24	CF	16	32	SHD
Texas	Swisher	C	2mo	M	7-26	CF	None	28	SHD
Texas	Hale	C	11	M	7-29	CF	16	32	SHD
Texas	Lynn	C	Unk.	M	7-29	CF	8	64	SHD
Texas	Hale	C	4mo	M	7-28	CF	None	64	SHD
Texas	Lubbock	C	13	F	8- 1	CF	None	28	SHD
Texas	Hale	P	10mo	F	8- 3	HI	140	140	CDC
Texas	Hale	C	28	M	8- 4	HI	20	320	CDC
Texas	Hale	C	25	F	8- 4	HI	None	320	CDC
Texas	Hale	C	7	M	8- 5	CF	8	128	SHD
Texas	Lubbock	C	18	M	8- 9	CF	None	32	SHD
Texas	Hale	C	2	F	8- 9	CF	None	32	SHD
Texas	Hale	C	2wk	F	8- 9	CF	None	128	SHD

Appendix A (continued)

State	County	Confirmed or Presumptive	Age	Sex	Onset	Test	Acute* Titer	Conv.* Titer	Lab.**
Texas	Lubbock	C	2	M	8-10	CF	8	16	SHD
Texas	Hale	C	5	M	8-10	CF	8	64	SHD
Texas	Castro	C	35	F	8-11	CF	Neg.	16	SHD
Texas	Lamb	P	5mo	M	8-14	HI	None	160	CDC
Texas	Hale	C	5	M	8-14	CF	Neg.	32	SHD
Texas	Hale	C	3mo	F	8-15	CF	8	32	SHD
Texas	Hale	C	2	M	8-16	CF	Neg.	64	SHD
Texas	Hale	C	36	F	8-17	CF	8	16	SHD
Texas	Hale	C	52	M	8-17	HI	160	640	CDC
Texas	Hale	C	17	M	8-20	CF	8	64	SHD
Texas	Hale	C	54	M	8-23	CF	8	64	SHD
Texas	Crosby	P***	54	M	8-25	HI	"Slight Rise"		SHD
Texas	Hale	C	2mo	M	8-25	CF	Neg.	32	SHD
Texas	Hale	C	5mo	M	8-28	CF	8	32	SHD
Texas	Crosby	C	62	M	8-30	CF	8	32	SHD
Texas	Hale	C	22	F	8-31	HI	320	160	CDC
Texas	Lamb	C	81	F	9- 2	CF	8	32	SHD
Texas	Hale	C	1	F	9- 4	HI	1280	1280	CDC
Texas	Lamb	C	12d	F	9-10	CF	8	32	SHD
Wash.	Spokane	C	3	F	8-24	CF	4	512	SHD

* Reciprocal titer

** SHD: State Health Department
CDC: Communicable Disease Center
GFPHL: Great Falls Public Health Laboratories

*** Cases listed by the state as having laboratory studies supporting the diagnosis were placed in the presumptive category if laboratory values were not stated.

Appendix B

CASES OF SLE WITH 1963 ONSETS REPORTED TO ENCEPHALITIS SURVEILLANCE UNIT

State	County	Confirmed or Presumptive	Age	Sex	Onset	Test	Acute* Titer	Conv.* Titer	Lab.**
Calif.	Fresno	P	4mo	F	8-25	CF	8	16	SHD
Calif.	Santa Cruz	C	37	M	8- 7	Neut.	0	3	SHD
Calif.	Fresno	C	13	F	9-23	CF	4	16	SHD
Calif.	Merced	P	6	M	9-11	CF	16	32	SHD
Calif.	Fresno	C	5	F	9-23	CF	4	16	SHD
Calif.	Placer	P	38	M	9-16	CF	32	64	SHD
Calif.	Yolo	P	46	M	9-20	CF	256	256	SHD
Calif.	Fresno	P	4	M	9-12	CF	4	8	SHD
Calif.	Stanislaus	P	6	M	9-23	CF	4	8	SHD
Calif.	Monterey	C	44	M	10- 3	CF	4	16	SHD
Calif.	Marin	C	61	F	10-18	Neut.	9	6	SHD
Calif.	San Joaquin	P	21	F	9-17	CF	32	64	SHD
Colo.	Adams	C	43	M	8- 1	CF	64	256	SHD
Ky.	Nelson	P	3mo	F	11-63	?	"Positive"		SHD
Mo.	Greene	P	22	M	7-27	CF	AC	32	SHD
Texas	Hale	P	44	M	8-12	HI	"Slight Rise"		CDC
Texas	Hale	P	35	F	8-18	HI	"Slight Rise"		CDC
Texas	Crosby	C	59	F	10- 1	CF	8	32	SHD
Texas	Crosby	C	31	F	10-15	CF	8	64	SHD

* Reciprocal titer

** SHD: State Health Department
CDC: Communicable Disease Center
GFPHL: Great Falls Public Health Laboratories

Appendix C

NON-HUMAN ARBOVIRUS ISOLATIONS, 1963

REPORTED TO THE ENCEPHALITIS SURVEILLANCE UNIT

1. Isolations from Mosquitoes

State	Species	Virus Isolated	No. Isolations	Lab.
Florida	C. (Melanoconion) Sp.	VEE	3	1
Florida	A. taeniorhynchus	VEE	1	1
Florida	A. infirmatus	Calif.-like	1	1
Florida	A. taeniorhynchus	Calif.-like	18	1
Florida	C. nigripalpus	Calif.-like	1	1
Florida	A. taeniorhynchus	Tensaw-like	30	1
Florida	An. crucians	Tensaw-like	6	1
Florida	P. confinnis	Tensaw-like	1	1
Georgia	C. melanura	EE	32	1
Georgia	A. atlanticus	EE	1	1
Georgia	C. nigripalpus	EE	1	1
Georgia	An. crucians	EE	1	1
Georgia	Psorophora Spp.	EE	1	4
Georgia	C. melanura	WE	15	1
Georgia	C. melanura	Hart Park	31	1
Georgia	A. atlanticus	Tensaw	2	1
Georgia	P. confinnis	Tensaw	16	1
Georgia	An. crucians	Tensaw	20	1
Georgia	An. quadrimaculatus	Tensaw	1	1
Georgia	A. mitchellae	Tensaw	3	1
Georgia	A. atlanticus	Calif.-like	44	1
N. Jersey	C. melanura	WE	2	6
Texas	C. tarsalis	WE	69	2
Texas	C. tarsalis	SLE	3	2
Texas	C. tarsalis	Hart Park	27	2
Texas	C. tarsalis	Turlock	4	2
Texas	C. quinquefasciatus	SLE	2	2

2. Isolations from Arthropods other than Mosquitoes

State	Species	Virus Isolated	No. Isolations	Lab.
N. Jersey	Lice (from WF Mice)	WE	1	6
N. Jersey	Fleas (from WF Mice)	WE	2	6

Appendix C

NON-HUMAN ARBOVIRUS ISOLATIONS, 1963

REPORTED TO THE ENCEPHALITIS SURVEILLANCE UNIT

1. Isolations from Mosquitoes

State	Species	Virus Isolated	No. Isolations	Lab.
Florida	C. (Melanoconion) Sp.	VEE	3	1
Florida	A. taeniorhynchus	VEE	1	1
Florida	A. infirmatus	Calif.-like	1	1
Florida	A. taeniorhynchus	Calif.-like	18	1
Florida	C. nigripalpus	Calif.-like	1	1
Florida	A. taeniorhynchus	Tensaw-like	30	1
Florida	An. crucians	Tensaw-like	6	1
Florida	P. confinnis	Tensaw-like	1	1
Georgia	C. melanura	EE	32	1
Georgia	A. atlanticus	EE	1	1
Georgia	C. nigripalpus	EE	1	1
Georgia	An. crucians	EE	1	1
Georgia	Psorophora Spp.	EE	1	4
Georgia	C. melanura	WE	15	1
Georgia	C. melanura	Hart Park	31	1
Georgia	A. atlanticus	Tensaw	2	1
Georgia	P. confinnis	Tensaw	16	1
Georgia	An. crucians	Tensaw	20	1
Georgia	An. quadrimaculatus	Tensaw	1	1
Georgia	A. mitchellae	Tensaw	3	1
Georgia	A. atlanticus	Calif.-like	44	1
N. Jersey	C. melanura	WE	2	6
Texas	C. tarsalis	WE	69	2
Texas	C. tarsalis	SLE	3	2
Texas	C. tarsalis	Hart Park	27	2
Texas	C. tarsalis	Turlock	4	2
Texas	C. quinquefasciatus	SLE	2	2

2. Isolations from Arthropods other than Mosquitoes

State	Species	Virus Isolated	No. Isolations	Lab.
N. Jersey	Lice (from WF Mice)	WE	1	6
N. Jersey	Fleas (from WF Mice)	WE	2	6

3. Isolations from Birds

State	Species	Virus Isolated	No. Isolations	Lab.
Alabama	White-eyed Vireo	EE	4	7
Alabama	White-eyed Vireo	WE	2	7
Alabama	Red-eyed Vireo	WE	1	7
Alabama	Cardinal	WE	2	7
Alabama	Cardinal	EE	1	7
Alabama	Hooded Warbler	EE	1	7
Alabama	Prothonotary Warbler	WE	1	7
N. Jersey	Wood Thrush	WE	3	6
N. Jersey	White-eyed Vireo	WE	1	6
N. Jersey	Flicker	WE	1	6
N. Jersey	Catbird	WE	4	6
N. Jersey	Blue Jay	WE	2	6
N. Jersey	Tufted Titmouse	WE	1	6
N. Jersey	English Sparrow	WE	1	6
N. Jersey	Wood Peewee	WE	1	6
N. Jersey	Veery	WE	1	6
N. Jersey	Black-capped Chickadee	EE	2	6
N. Jersey	Palm Warbler	WE	1	6
N. Jersey	Robin	WE	2	6
N. Jersey	Rufous Sided Towhee	WE	1	6
N. Jersey	Myrtle Warbler	EE	1	6
N. Jersey	Slate Colored Junco	EE	1	6
N. Jersey	Slate Colored Junco	WE	2	6
N. Jersey	Downy Woodpecker	WE	1	6

4. Isolations from Mammals

State	Species	Virus Isolated	No. Isolations	Lab.
Alabama	Horse	EE	1	1
Calif.	Horse	WE	10	3
Calif.	Horse	SLE	1	3
Georgia	Horse	EE	17	4
La.	Horse	EE	2	1
N. M.	Mouse	WE	1	1
N. Jersey	Whitefooted Mouse	WE	4	6
N. Jersey	Norway Rat	WE	3	6
N. Jersey	Spring Peeper	WE	1	6
N. Jersey	Eastern Cottontail Rabbit	WE	2	6
N. Jersey	Eastern Cottontail	EE	1	6
N. Jersey	Meadow Vole	WE	1	6
N. Jersey	Whitetail Deer	EE	1	6

Appendix C (continued)

5. Isolations from Reptiles

State	Species	Virus Isolated	No. Isolations	Lab.
	Snakes			
Utah	Thamnophis	WE	29	5
Utah	Coluber	WE	4	5
Utah	Pituophis	WE	4	5
	Turtles			
N. Jersey	Eastern Box Turtle	WE	1	6
N. Jersey	No. Diamondbacked Terrapin	WE	1	6

(1) Virology Section, Laboratory Branch, CDC.
(2) CDC Field Station, Greeley, Colorado.
(3) Viral and Rickettsial Disease Laboratory, California Department of Public Health, Berkeley, California.
(4) Virology Section, Georgia Department of Public Health, Atlanta, Georgia.
(5) Department of Microbiology, University of Utah College of Medicine.
(6) New Jersey State Health Department Division of Laboratories, Trenton, New Jersey.
(7) Virus Ecology Section, Laboratory Branch, CDC.

5. Isolations from Reptiles

State	Species	Virus Isolated	No. Isolations	Lab.
	Snakes			
Utah	Thamnophis	WE	29	5
Utah	Coluber	WE	4	5
Utah	Pituophis	WE	4	5
	Turtles			
N. Jersey	Eastern Box Turtle	WE	1	6
N. Jersey	No. Diamondbacked Terrapin	WE	1	6

(1) Virology Section, Laboratory Branch, CDC.
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(4) Virology Section, Georgia Department of Public Health, Atlanta, Georgia
(5) Department of Microbiology, University of Utah College of Medicine.
(6) New Jersey State Health Department Division of Laboratories, Trenton, New Jersey.
(7) Virus Ecology Section, Laboratory Branch, CDC.

Key to all disease surveillance activities are those in each State who serve the function as State epidemiologists. Responsible for the collection, intrepretation and transmission of data and epidemiological information from their individual States, the State epidemiologists perform a most vital role. Their major contributions to the evolution of this report are gratefully acknowledged.

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